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10 CFR 50.12  
10 CFR 50.47  
10 CFR 50, Appendix E

RA-17-078

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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Oyster Creek Nuclear Generating Station  
Renewed Facility Operating License No. DPR-16  
NRC Docket Nos. 50-219 and 72-15

Subject: Response to Request for Additional Information (RAI) Regarding Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR Part 50, Appendix E

Reference:

- 1) Letter from Michael P. Gallagher, (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission – *"Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E,"* dated August 22, 2017 (ML17234A082)
- 2) U.S. Nuclear Regulatory Commission Electronic Mail Request to David Helker, et al., Exelon Generation Company, LLC - Draft Request for Additional Information – Oyster Creek EP Exemption, dated November 8, 2017
- 3) U.S. Nuclear Regulatory Commission Electronic Mail Request to David Helker, et al., (Exelon Generation Company, LLC) - Draft Request for Additional Information – Oyster Creek EP Exemption, dated November 15, 2017
- 4) U.S. Nuclear Regulatory Commission Electronic Mail Request to David Helker (Exelon Generation Company, LLC) – *"Oyster Creek Nuclear Generating Station - Request for Additional Information Regarding License Amendment Request For Emergency Plan Exemption (CAC NO. MG0153; EPID L-2017-LLE-0020),"* dated November 15, 2017 (ML17319A942)
- 5) U.S. Nuclear Regulatory Commission Electronic Mail Request to David Helker (Exelon Generation Company, LLC) – *"Oyster Creek Nuclear Generating Station - Request for Additional Information Regarding License Amendment Request For Emergency Plan Exemption (CAC NO. MG0153; EPID L-2017-LLE-0020),"* dated November 16, 2017 (ML17320A637)

By letter dated August 22, 2017 (Reference 1), Exelon Generation Company, LLC (Exelon) requested an exemption pursuant to the requirements of 10 CFR 50.12 from specific emergency planning requirements in 10 CFR 50.47 and 10 CFR Part 50, Appendix E for the Oyster Creek Nuclear Generating Station (OCNGS). This exemption was requested based on the proposed permanent cessation of power operations and removal of fuel from the reactor vessel, which is expected by no later than December 31, 2019.

Subsequently, in electronic mail requests dated November 8, 2017 (Reference 2) and November 15, 2017 (Reference 3), the U.S. Nuclear Regulatory Commission (NRC) issued draft Requests for Additional Information (RAIs) indicating that it had reviewed the information submitted in the Reference 1 letter and that additional clarifying information was needed to support its continued review. The draft RAIs in References 2 and 3 were further discussed during teleconferences between Exelon and NRC representatives held on November 15 and 16, 2017, respectively. As a result of the discussions, it was determined that no modifications to the draft RAIs were needed and the NRC subsequently issued formal RAIs on November 15 and 16, 2017 (References 4 and 5), and requested a response by December 15, 2017.

Accordingly, Attachment 1 of this letter provides Exelon's responses to the NRC's RAIs.

Exelon has reviewed the information supporting a finding of No Significant Hazards Consideration and the Environmental Consideration provided to the NRC in Reference 1. The additional information provided in this submittal does not affect the previously stated bases in Reference 1 for concluding that the proposed exemption does not involve a significant hazards consideration. In addition, the information provided in this submittal does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed exemption.

There are no regulatory commitments contained in this submittal.

If you have any questions concerning this submittal, please contact Paul Bonnett at (610) 765-5264.

Respectfully,



Michael P. Gallagher  
Vice President, License Renewal & Decommissioning  
Exelon Generation Company, LLC

Attachment: 1. Response to NRC's Request for Additional Information

cc: w/Attachment

Regional Administrator - NRC Region I  
NRC Senior Resident Inspector - Oyster Creek Nuclear Generating Station  
NRC Project Manager, NRR - Oyster Creek Nuclear Generating Station  
Director, Bureau of Nuclear Engineering - New Jersey Department of Environmental Protection  
Mayor of Lacey Township, Forked River, NJ

**Attachment 1**

**Response to NRC's Request for Additional Information**

## **SUMMARY**

By letter dated August 22, 2017 (Reference 1), Exelon Generation Company, LLC (Exelon) requested an exemption pursuant to the requirements of 10 CFR 50.12 from specific emergency planning requirements in 10 CFR 50.47, "Emergency plans," and 10 CFR Part 50, Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," for the Oyster Creek Nuclear Generating Station (OCNGS). This exemption was requested based on the proposed permanent cessation of power operations and removal of fuel from the reactor vessel, which is expected by no later than December 31, 2019. The exemption request was developed consistent with guidance provided in NRC Interim Staff Guidance (ISG) NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants" (Reference 6). The exemption request considered the storage of the spent nuclear fuel in the spent fuel pool (SFP) and the onsite independent spent fuel storage installation (ISFSI), and the low likelihood of any credible accident resulting in radiological releases requiring offsite protective measures.

Subsequently, in electronic mail requests dated November 8, 2017 (Reference 2) and November 15, 2017 (Reference 3), the U.S. Nuclear Regulatory Commission (NRC) issued draft Requests for Additional Information (RAIs) indicating that it had reviewed the information submitted in the Reference 1 letter and that additional clarifying information was needed to support its continued review. The draft RAIs in References 2 and 3 were further discussed during teleconferences between Exelon and NRC representatives held on November 15 and 16, 2017, respectively. As a result of the discussions, it was determined that no modifications to the draft RAIs were needed and the NRC subsequently issued formal RAIs via electronic mail on November 15 and 16, 2017 (References 4 and 5), and requested a response by December 15, 2017.

Accordingly, this attachment restates the NRC's RAI questions contained in the Reference 4 and 5 electronic mail requests followed by Exelon's response.

## **RESPONSE TO RAI QUESTION**

### **RAI-OCNGS-1**

*Attachment 1, Section 3.0, "Basis for Exemption Request," states, in part, that:*

*Exelon has performed an analysis indicating that 12 months after permanent cessation of power operations, the spent fuel in the SFP will have decayed to the extent that the requested exemptions can be implemented at OCNGS without any compensatory measures.*

*Please clarify what is meant by the statement "without any compensatory measures."*

### **Exelon's Response to RAI-OCNGS-1**

Exelon performed an analysis to conservatively evaluate the length of time it takes for an uncovered spent fuel assembly in the SFP to reach the temperature where the zirconium cladding would fail without any compensatory measures being taken to return water inventory or cooling to the spent fuel. Specifically, this analysis is being used to support the Permanently Defueled Emergency Plan (PDEP) License Amendment Request (LAR) submittal to show that a minimum of 10 hours is available before fuel cladding temperature reaches 900°C with a complete loss of SFP water inventory with no heat loss (adiabatic heat up), which supports the guidance of ISG-

02, Section 5, Item 2. With regards to the statement "*without any compensatory measures*" the supporting analysis shows that 12 months after permanent shutdown there is sufficient time within the 10 hours described in the supporting analysis to mitigate events that could lead to a zirconium cladding fire.

## **RAI-OCNGS-2**

*The exemption of item 1 in Table 1 (Attachment 1) states:*

*10 CFR 50.47(b) The onsite ~~and, except as provided in paragraph (d) of this section,~~ ~~offsite~~ emergency response plans for nuclear power reactors must meet the following standards:*

*In the basis for exemption OCNGS states, in part, that:*

*Several systems will be available to provide makeup water to the SFP, such as Torus water, Firewater, and portable FLEX and B.5.b pumps. These systems provide diversity with electrical driven pumps, installed diesel and portable diesel pumps. Water sources are from various tanks, fire pond, and intake or discharge canal water.*

*OCNGS maintains procedures and strategies for the movement of any necessary portable equipment that will be relied upon for mitigating the loss of SFP water. These mitigative strategies are maintained in accordance with License Condition 2.C.(8) of the OCNGS Renewed Facility Operating License. These diverse strategies provide defense-in-depth and ample time to provide makeup water or spray to the SFP prior to the onset of zirconium cladding ignition when considering very low probability beyond design basis events affecting the SFP.*

*Please provide additional details regarding the diverse mitigation strategies, to include the identification of the on-shift personnel designated for carrying out the necessary tasks and the timeframe for implementation of these diverse mitigation strategies.*

## **Exelon's Response to RAI-OCNGS-2**

If normal SFP cooling, makeup, and installed backup systems fail to provide either cooling or make up water to the SFP, the mitigating strategy is to utilize Flexible Mitigating Strategies (FLEX) or Extensive Damage Mitigating Guidelines (EDMGs) and associated equipment. The FLEX and EDMG equipment and programs that are maintained for SFP defense-in-depth mitigating strategies provide for diverse SFP makeup and/or cooling well within a 10-hour period. The OCNGS Staffing Timeline Integrated Review documented in the FLEX Integrated Plan (OP-OC-118-1001, "Oyster Creek FLEX Validation Plan," Attachment 4), shows that two (2) trained on-shift individuals can implement the established FLEX procedures to remove debris, route hoses, and establish an operating FLEX diesel pump to supply makeup water to the SFP within 4 hours. As a redundant strategy, the EDMG procedures also provide the guidance necessary to establish makeup to the SFP in under 4 hours by using the EDMG portable diesel pump with two (2) trained on-shift individuals. The above tasks would be performed by two (2) on-shift individuals who do not have other assigned required emergency preparedness (EP) tasks. Direction and selection of these tasks will continue to be directed by the Certified Fuel Handler and Non-Certified Fuel Handler.

### RAI-OCNGS-3

The exemption of item 13 in Table 1 (Attachment 1) states:

~~10 CFR 50.47(c)(2) Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.~~

In the basis for exemption OCNGS states, in part, that:

*OCNGS is not a gas cooled reactor and is not authorized for power operation.*

The staff does not exempt a decommissioning reactor licensee from the following regulation as it is not applicable.

*The size of the emergency planning zones (EPZs) also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 megawatt (MW) thermal.*

Please clarify why OCNGS is requesting an exemption from regulations that are currently not applicable, or revise accordingly.

### Exelon's Response to RAI-OCNGS-3

Exelon withdraws its request to exempt the statement below as it is not applicable to OCNGS:

The size of the emergency planning zones (EPZs) also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 megawatt (MW) thermal.

Exelon also withdraws the statement below in the basis for the exemption:

~~OCNGS is not a gas cooled reactor and is not authorized for power operation.~~

Exelon, therefore, amends its request for exemption of 10 CFR 50.47(c)(2) as follows:

~~Generally, the plume exposure pathway EPZ for nuclear power plants shall consist of an area about 10 miles (16 km) in radius and the ingestion pathway EPZ shall consist of an area about 50 miles (80 km) in radius. The exact size and configuration of the EPZs surrounding a particular nuclear power reactor shall be determined in relation to local emergency response needs and capabilities as they are affected by such conditions as demography, topography, land characteristics, access routes, and jurisdictional boundaries. The size of the EPZs also may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized power level less than 250 MW thermal. The plans for the ingestion pathway shall focus on such actions as are appropriate to protect the food ingestion pathway.~~

Refer to the basis of 10 CFR 50.47(b)(10) for the basis for exemption of this regulation.

#### **RAI-OCNGS-4**

*The exemption of item 8 in Table 2 (Attachment 1) states:*

##### *A. Organization*

*The organization for coping <...>*

*It is unclear to the staff whether or not an exemption is requested for Appendix E, Section IV.7.A of 10 CFR Part 50. Please clarify exact regulation wording to be retained and which is being requested for exemption.*

#### **Exelon's Response to RAI-OCNGS-4**

It was not Exelon's intent to apply for exemption from the requirements found in the introductory paragraph of 10 CFR Part 50, Appendix E, Section IV.7.A - Organization. Therefore, Exelon amends its request for exemption for 10 CFR Part 50, Appendix E, Section IV.7 as follows:

IV.7.A - Organization – No Exemption is requested.

IV.7.A.1. - A description of the normal plant ~~operating~~ organization.

#### **RAI-OCNGS-5**

*The exemption of item 14 in Table 2 (Attachment 1) states:*

*A.7. ~~By June 23, 2014, [I]dentification of, and a description of~~ the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including ~~hostile action at the site. For purposes of this appendix, "hostile action" is defined as~~ an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.*

*In the basis for exemption OCNGS states, in part, that:*

*OCNGS will maintain appropriate actions for the protection of onsite personnel in a security-based event. The scope of protective actions will be appropriate for the defueled plant status, but will not be the same as actions necessary for an operating power plant.*

*Please provide further discussion on what the scope of protective actions are for onsite personnel in a defueled status versus an operating plant for a security-based event.*

#### **Exelon's Response to RAI-OCNGS-5**

Although the NRC has previously exempted decommissioning power reactors from "hostile action" considerations, the OCNGS physical security plan continues to provide high assurance against a potential security event impacting a designated target set. Therefore, some EP requirements for security-based events are maintained. Protective actions are maintained for onsite personnel through the classification of security-based events, notification of offsite authorities, and coordination of offsite response organizations (i.e., local law enforcement,

firefighting, medical assistance) onsite under a comprehensive emergency management plan (CEMP) concept.

#### **RAI-OCNGS-6**

*In the basis for exemption of item 23 in Table 2 (Attachment 1), OCNGS states, in part, that:*

*OCNGS proposes to complete emergency notifications within 60 minutes after the availability of indications to operators that an emergency action level (EAL) threshold has been reached.*

*New Jersey Emergency Management officials have been able to review and concur with this proposal. The State will provide a letter with the Emergency Plan submittal acknowledging the notification period.*

*The letter from the State of New Jersey that was provided with the referenced submittal stated in part:*

*The Bureau of Nuclear Engineering (BNE) provided comments regarding the proposed changes contained in the above documents on August 21, 2017, and met with Exelon on August 25, 2017, to discuss these comments. The Bureau will review the final submittal after it is filed with the NRC and determine if further comments are warranted at that time.*

*Please provide documentation that the State of New Jersey is in agreement with the 60 minute timeframe for notification.*

#### **Exelon's Response to RAI-OCNGS-6**

The State of New Jersey Bureau of Nuclear Engineering (NJBNE) provided input during the development of both the Exemption request and PDEP LAR. It was the NJBNE's desire to be notified within 60 minutes of the event. The result of the discussion between the State and OCNGS led to an agreement of the timeframe and phrasing of the requirement to notify the State as, "Notification is made within 60 minutes after the availability of indications to operators that an EAL threshold has been reached." The State of New Jersey completed a subsequent review of both the drafted Exemption request and the PDEP LAR prior to their submittal to the NRC and provided no further comments. The NJBNE letter attached to the PDEP LAR submittal dated August 29, 2017, documents that the State of New Jersey reviewed and discussed comments with Exelon prior to submittal. All comments provided by the State of New Jersey were satisfactorily resolved with the NJBNE during the meeting held on August 25, 2017.

#### **RAI-OCNGS-7**

*The exemption of item 32 in Table 2 (Attachment 1) states:*

*E.9.a. Provisions for communications with contiguous State/local governments ~~within the plume exposure pathway EPZ~~. Such communication shall be tested monthly.*

*In the basis for exemption OCNGS states, in part, that:*

*OCNGS will maintain communications with the State of New Jersey and the NRC. Note, the State and local officials, and agencies for which provisions will be maintained are those which OCNGS is currently committed to.*



*For clarification purposes, please provide a description of communications that will continue to be performed with State and local government officials/agencies and at what frequency those communications are tested.*

#### **Exelon's Response to RAI-OCNGS-7**

Existing commercial phone lines will continue to be used to communicate EP notifications to the State of New Jersey and will continue to be functionally tested monthly. Note that Exelon will maintain the existing auto-ring down communication system as a non-regulatory commitment to the State of New Jersey.

#### **RAI-OCNGS-8**

*The exemption of item 34 in Table 2 (Attachment 1) states:*

**~~E.9.c Provision for communications among the nuclear power reactor control room, the onsite technical support center, and the emergency operations facility; and among the nuclear facility, the principal State and local emergency operations centers, and the field assessment teams. Such communications systems shall be tested annually.~~**

*This is inconsistent with the basis for exemption of item 34 in Table 2 (Attachment 1), in which OCNGS states, in part, that:*

*OCNGS will also continue to test communication systems used to contact the State Emergency Operations Center (EOC) on an annual basis.*

- a. Please clarify basis for requesting an exemption for "Provision of communications... among the nuclear facility, the principal State and local emergency operations centers....," based on intent to maintain provisions for communications with State and local officials and agencies for which OCNGS is currently committed to, as described in basis for exemption of item 32 in Table 2 (Attachment 1).*
- b. Please clarify why Exelon is requesting to remove requirement to test communications systems with these officials/agencies annually.*

#### **Exelon's Response to RAI-OCNGS-8**

Exelon amends its basis statement for this exemption as follows:

OCNGS has developed an analysis indicating that 12 months after permanent cessation of power operations, no credible accident at OCNGS will result in radiological releases requiring offsite protective actions; or in the event of beyond design basis accidents, 10 hours is available to take mitigative actions, and if needed, implement offsite protective actions using CEMP concept. Therefore, there is no need for the Technical Support Center (TSC), Emergency Operations Facility (EOF), or field assessment teams. Additionally, there is no need to maintain and test committed provisions for communications with State and local emergency operations centers (EOCs).

However, refer to justification for 10 CFR 50.47(b)(3). Communication with State and local EOCs is maintained to coordinate assistance on site if required.

### **RAI-OCNGS-9**

*The response to Industry Decommissioning Commitment (IDC) 1 provided in Table 4 and the response to Staff Decommissioning Assumption (SDA) 5 provided in Table 5 of Attachment 1 to the exemption request are inconsistent with the discussion of control of heavy loads included in Section 9.1.4 of the OCNGS Updated Final Safety Analysis Report (UFSAR), Revision 19. Specifically, Section 9.1.4 of the UFSAR states that the reactor building crane was upgraded to a single failure proof design in July 2000 and addresses the safe handling of loads using a single failure proof handling system, whereas the responses to IDC 1 and SDA 5 address conformance with Phase I requested actions related to control of heavy loads, which does not include single failure proof handling systems, and references an NRC safety evaluation that predates the crane upgrade. Confirm that Revision 19 of the OCNGS UFSAR accurately reflects the control of heavy loads measures that will be employed during fuel cask and other heavy load handling activities near the spent fuel pool during the permanently defueled period while fuel remains in the spent fuel pool.*

### **Exelon's Response to RAI-OCNGS-9**

The OCNGS UFSAR Revision 19 accurately reflects the control of heavy loads measures with a single failure proof crane that will continue to be employed during fuel cask and other heavy load handling activities near the SFP during the permanently defueled period.

### **RAI-OCNGS-10**

*Section 5.6, "Consequences of a Beyond Design-Basis Earthquake," of Attachment 1 to the exemption request compares OGNGS spent fuel storage characteristics with those of the reference plant evaluated by the staff in NUREG-2161, "Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor," dated September 2014 (ADAMS Accession No. ML14255A365). However, the comparison does not address the distribution of recently discharged fuel (an important parameter used in the NUREG-2161 evaluation) that will exist once the OCNGS reactor is permanently defueled. Describe the fuel distribution that will exist at the time the emergency plan changes that would be permitted by the requested exemption are scheduled for implementation.*

### **Exelon's Response to RAI-OCNGS-10**

The fuel will be thermally dispersed at the time the emergency plan changes permitted by this exemption are implemented. The fuel that is removed from the reactor on final shutdown is considered the "hottest" fuel and will have decayed for 1 year at the time that this exemption commences. The "hottest" fuel bundles will be dispersed in a pattern where cooler fuel (removed from the reactor for at least 4 years) with less decay heat will surround the hottest bundles. Storing spent fuel in a dispersed pattern in SFP promotes air coolability of the spent fuel in the unlikely event of a loss of water. This ensures that fuel distribution in the SFP will be bounded by that assumed in NUREG-2161. OCNGS fuel is from a lower powered reactor and there will be less total fuel bundles in the SFP than was stated for the reference plant in NUREG-2161.

**References:**

1. Letter from Michael P. Gallagher, (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission – "Request for Exemption from Portions of 10 CFR 50.47 and 10 CFR 50, Appendix E," dated August 22, 2017 (ML17234A082)
2. U.S. Nuclear Regulatory Commission Electronic Mail Request to David Helker, et al., (Exelon Generation Company, LLC) - Draft Request for Additional Information – Oyster Creek EP Exemption, dated November 8, 2017
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6. U.S. Nuclear Regulatory Commission Interim Staff Guidance (ISG) NSIR/DPR-ISG-02, "Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants," dated May 11, 2015 (ML14106A057)